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AEROPLANE

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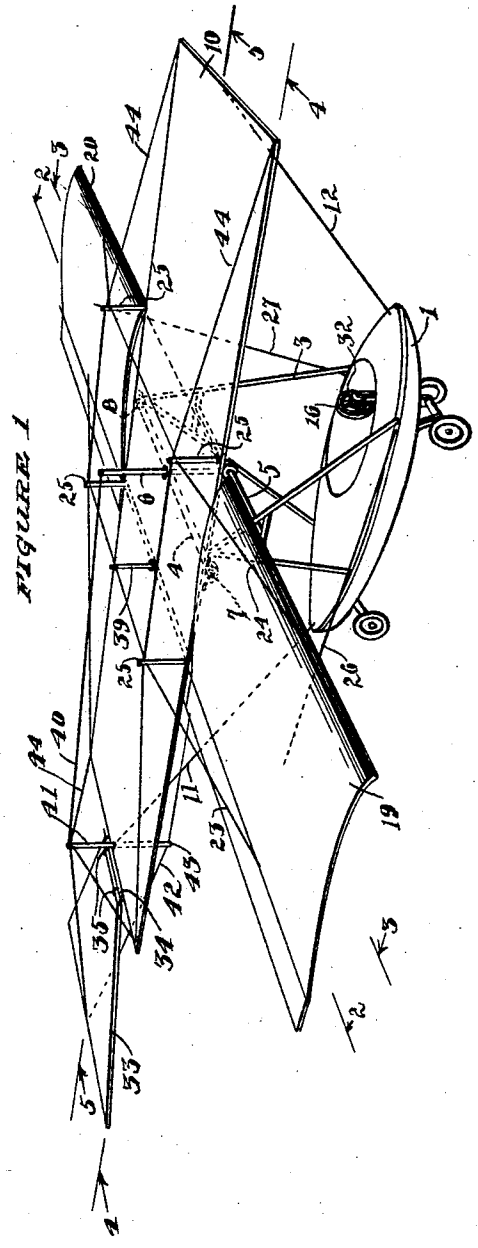


FIGURE 1

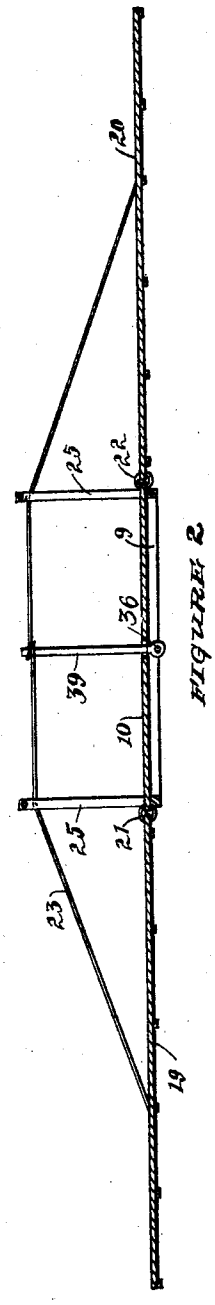


FIGURE 2

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FIGURE 3

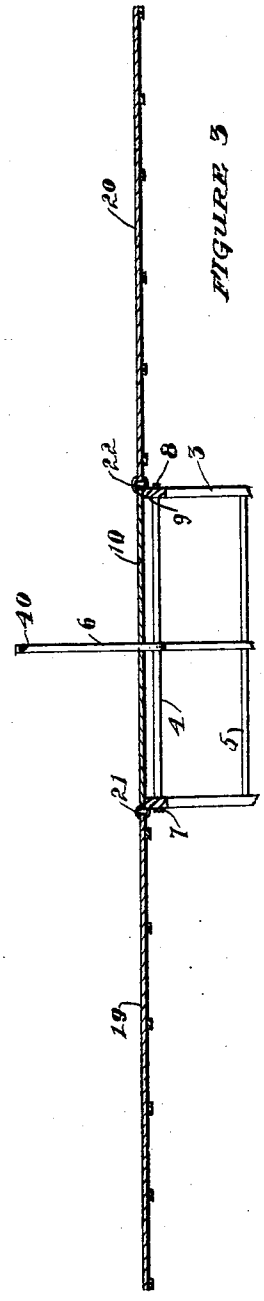
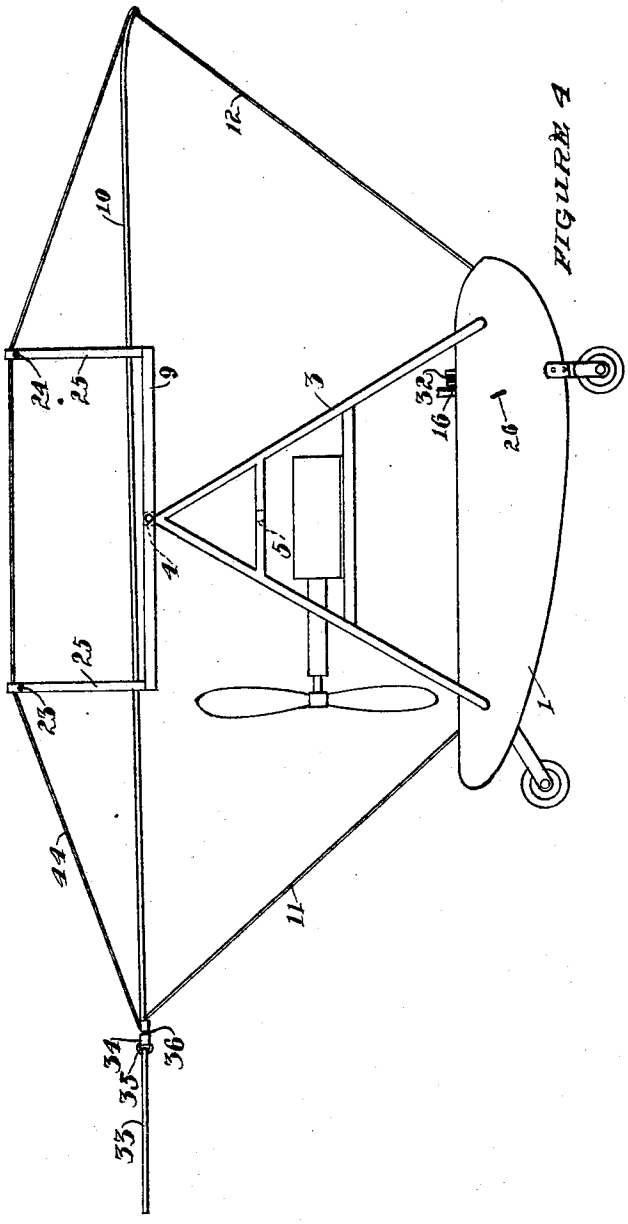


FIGURE 4



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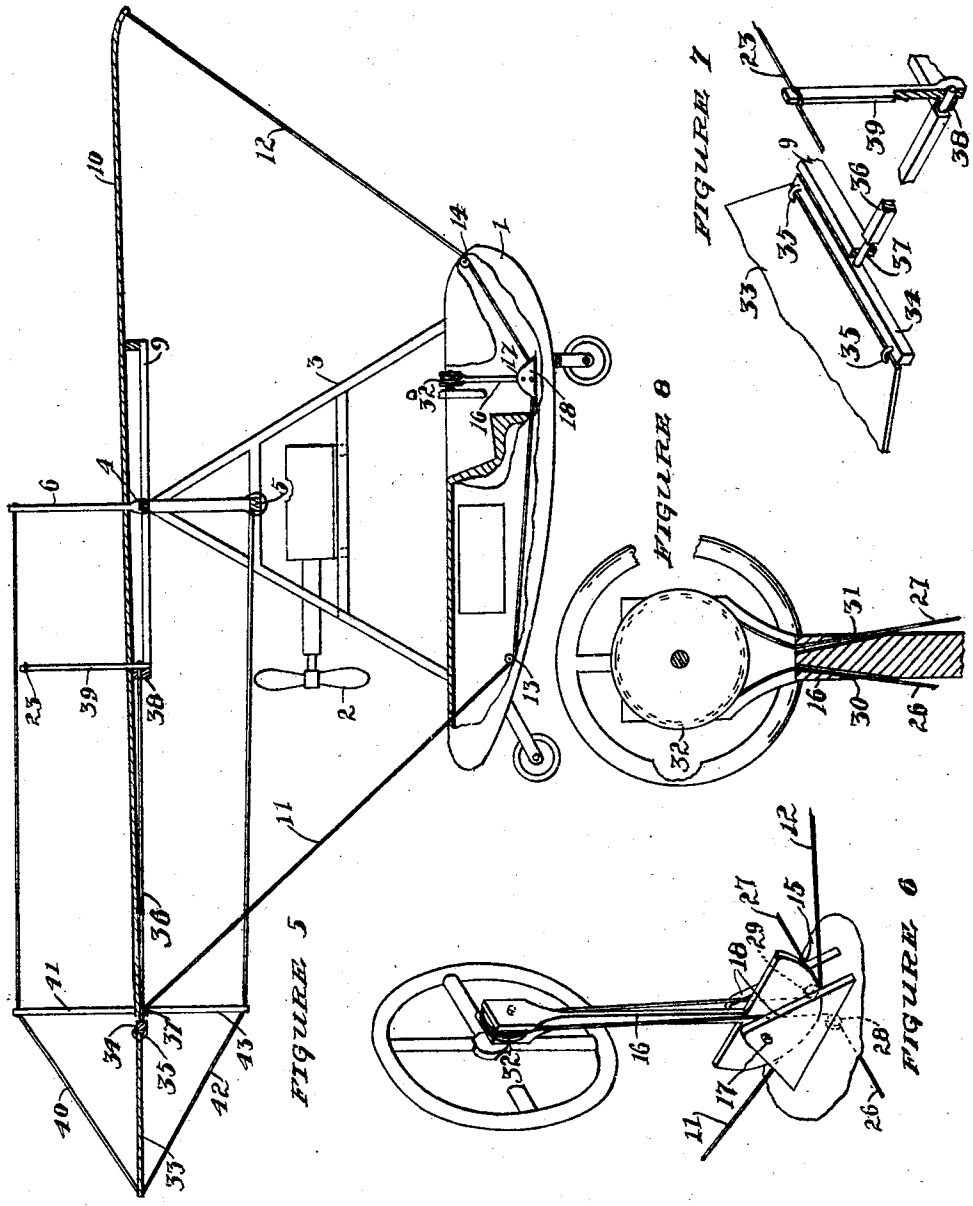


FIGURE 5

FIGURE 7

FIGURE 8

FIGURE 6

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44. AERONAUTICS

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Patented Sept. 3, 1929. 1,727,047

UNITED STATES PATENT OFFICE.

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AEROPLANE.

Application filed March 24, 1928. Serial No. 264,409.

It is one object of the invention to provide an aeroplane that has a large measure of inherent stability whereby to relieve the operator as much as possible of the incessant watchfulness ordinarily required and maintain a perfect equilibrium under varying conditions.

It is another object of the invention to provide a simple, novel and highly efficient controlling means for an aeroplane of the character indicated.

It is also an object of the invention to provide a simple control for an aeroplane of the character indicated that is highly and instantly effective whenever applied, and one that will be sensitive to angular adjustments and speed effects whereby to keep the operator constantly informed when a dangerous angle or speed has been reached.

It is a still further object to provide an aeroplane of the character indicated that will be simple in form and construction, economical to manufacture, positive in action and control, and highly efficient in its practical application.

In the drawing:

Figure 1 is a perspective illustration showing my improved construction.

Figure 2 is a sectional view on 2—2, Figure 1.

Figure 3 is a sectional view on 3—3, Figure 1.

Figure 4 is a view on line 4—4, Figure 1.

Figure 5 is a view on line 5—5, Figure 1.

Figure 6 is a perspective of the control lever and its mounting.

Figure 7 is a perspective view of a portion of the aeroplane showing the mounting of the tail plane.

Figure 8 is a detail of the control lever.

Referring now more particularly to the drawing, I show at 1 a fuselage of any suitable type and preferably with propellers as 2 located at the rear thereof.

Erected upon the fuselage 1 as an integral part thereof is a frame 3 including a cross top bar 4 and a cross bar 5 positioned directly under bar 4. Mounted upon the bars 4 and 5 and extending upwardly a distance beyond the frame 3 is an arm 6. The arm 6 is positioned midway the length of bars 4 and 5 and the whole frame is so positioned relative to the fuselage 1 that if the arm 6 were extended downwardly it would pass substantially through the center of gravity of the said fuselage. The ends of the bar 4 form pivot pins at 7 and 8 respectively.

A framework 9 is shown having pivotal connection with the cross bar 4 at 7 and 8, this frame extending forwardly and rearwardly of the bar and carrying a central supporting plane 10. By means of this construction a relative rocking movement may be set up between the fuselage 1 and plane 10. In the present instance this movement or pivotal adjustment is secured through the medium of cables 11 and 12 connected to the front and rear ends of the plane 10 and passing into the fuselage over sheaves 13 and 14 and thence to the lower curved edge 15 of a lever 16 fulcrumed at 17 on suitable supports 18. Obviously, any shifting of the lever will impart a movement to the plane whereby it may be quickly moved into any desirable angle relative to the plane of the fuselage.

At 19 and 20 I show laterally extending wings pivotally connected at their inner ends to the plane 10 as shown at 21 and 22. This connection causes these wings to change their angles of incidence simultaneously with the plane 10 and to the same degree, but permits them to be swung about axes lying in the plane of plane 10. At 23 and 24 are shown cables connected at their ends to the wings 19 and 20 a distance from their pivotal mountings and slidably engaging upstanding posts 25 on frame 9, these cables serving as supports for the wings and as means for securing proper relative movements between them. At 26 and 27 are cables attached to the under sides of the wings 19 and 20 at points spaced equally distant from their pivotal points and passing downwardly into fuselage 1 and over sheaves 28 and 29 and thence upwardly through conduits 30—31 in the handle portion of lever 16 and around a sheave 32 as shown. Rotation of sheave 32 will obviously move wings 19 and 20 equally and in opposite directions.

At 33 I show a tail plane pivotally mounted upon a bar 34 as at 35, and this bar is in turn mounted upon a shaft 36 with which it turns. The shaft 36 is revolubly mounted in frame 9 at 37 and 38 and is fitted with an operating lever 39 on its inner end. The lever 39 extends upwardly a distance and is connected to the cable 23 so that a movement of the cable 23 will cause a rotating movement of the shaft 36 with consequent lateral deflection of the tail plane 33. A cable 40 extends from the

rear end of the tail plane 33 over a support 41 at the rear end of frame 9 and to the upper end of the arm 6, and a second cable 42 extends from the rear end of the tail plane over a downwardly extending support 43 at the rear end of frame 9 and to the frame 3. By means of these cables 40 and 42 the tail plane is swung about its pivotal mounting 35 whenever the plane 10 is pivotally adjusted relative to fuselage 1. Guy wires are indicated at 44.

By means of the construction above described an inherently stable aeroplane is provided, and one that is under complete control from a single operating lever. The stability is secured through the relative arrangement of the load and the supporting planes, and the mode of operation of the several supporting planes relative to each other and to the load.

Operation of the sheave 33 in one direction swings one wing upwardly and the other downwardly, while a movement of the sheave in the opposite direction reverses the movement of the wings. Throwing the lever 16 forwardly draws the nose of the fuselage and the front end of the plane 10 toward each other thereby changing the angle of incidence of the plane 10 and wings 19 and 20 and at the same time swinging the tail plane 33 downwardly. Throwing the lever in the opposite direction will have the reverse effect of tilting the plane 10 upwardly and at the same time swing the tail plane upwardly. Through the medium of parts 36 and 39 the tail plane is also pivotally adjusted to an angle corresponding to that assumed by the wings 19 and 20.

In the case of the usual form of aeroplane it is so heavily loaded and so rigidly constructed, and the parts are so arranged that a gust of air striking the plane from below and in front tends to force it upwardly and backwardly thereby making it become tail heavy and threatening to throw it into a tail spin. In my improved form of aeroplane the result is different. The whole structure is light and flexible with the load properly positioned relative to the planes, and the planes and wings are instantly swung into a new position to meet the changed air current and the plane rides or volplanes forwardly on the rising air current without, perhaps, materially changing its formal level. This illustration may be elaborated upon to show that my improved aeroplane is capable of reaching and maintaining a high degree of flying efficiency under any varying atmospheric conditions.

It is to be understood, of course, that while I have herein shown and described but one specific embodiment of the invention, changes in form, construction, method of operation, and relative positions of the several parts and features, may be made within the scope of the appended claims.

I claim:

1. An aeroplane including a fuselage, a frame mounted thereon and extending thereabove, a plane overlying the fuselage and pivotally mounted on the frame, a tail plane pivotally mounted on the first plane on an axis lying transversely thereof and also upon an axis coinciding with the longitudinal axis of the first plane, laterally extending wing planes pivotally mounted on the first plane, cooperative means for simultaneously moving the first plane and tail plane through equal arcs in opposite directions, and cooperative means for moving the wing planes and tail plane through equal arcs in the same direction.

2. An aeroplane including a plane, a fuselage suspended therefrom, a pivotal connection between the plane and fuselage, oppositely extending wings pivotally mounted on the plane and normally supported in the plane thereof, a tail plane pivotally mounted on the first plane and normally lying in the plane thereof, a control, control operated means for placing the first plane and tail plane in angular relation to each other, control operated means for moving the wings and first plane into angular relation to each other, and means actuated by movement of the wings for maintaining the tail plane in a plane parallel with the wing planes.

3. An aeroplane including a plane, a fuselage suspended therefrom, a pivotal connection between the plane and fuselage, oppositely extending wings mounted on the plane, and a tail plane pivotally mounted on the first plane and on an axis lying transversely thereof and also upon an axis at right angles to the first axis, and means for controlling the pivotal movements of the first plane and the tail plane.

EDWARD M. BURCHELL.